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This cross-sectional analysis explored (a) children's achievement performance, assessed by academic tests and measure of intelligence, (b) children's attitudes toward achievement, and (c) maternal attitudes toward independence training. Fifty-nine boys and fifty-five girls of high IQ and their mothers were subjects. Effective achievement performance was associated with permissiveness toward controlling child behavior, but it did not rely on either earlier or later independence training. Mothers who favored early training rewarded efforts, despite quality of performance, and the children aspired to the expected role. The child's attitude, predictive of effective achievement, was that his efforts determined the outcome he received. In boys and girls, belief in personal control of outcome was associated with early independence training attitudes in a permissive mother. Need achievement in boys was associated with early training by a mother concerned with controlling child behavior; and in girls, it was associated with later training. Over 100 children were subjects of a longitudinal analysis, which indicated achievement and mother-and-child correlates were similar to the cross-sectional analysis. One finding, however, was that maternal "controllingness" was negatively associated with between-child differences in achievement in both sexes. The tables and appendixes are no t included. (DO)

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MOTHER-CHILD RELATIONS AND CHILDREN'S ACHIEVEMENT

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TABLE OF CONTENTS

	Page
Introduction	1
Part I	6
Method	6
Subjects and Setting	6
Collection and Preparation of Data	7
Results and Discussion	10
Relations Among Maternal Variables	10
Relations Among Children's Achievement Measures	10
Relations Among Children's Needs and Attitudes	10
Maternal Variables and Effectiveness of Children's Achievement Performance	11
Maternal Variables and Within-Child Patterns of Achievement	13
Maternal Variables and Children's Needs and Attitudes	15
Children's Achievement Performance and Their Needs and Attitudes	18
Summary of the Cross Sectional Study	22
Principal Outcomes	22
Part II	24
Method	25
Results and Discussion	27
Maternal Variables and Changes in Children's Achievement Over Five Years	28
Child Variables and Changes in Children's Achievement Over Five Years	30
Summary of Longitudinal Findings	31
References	33

LIST OF TABLES

Table		Page
1	Relations Among Measures of Maternal Variables	36
2	Relations Among Measures of Children's Needs and Attitudes	37
3	Relations of Maternal Variables to Children's Achievement Performance	38
4	Relations of Maternal Variables to Children's Needs and Attitudes	39
5	Relations of Children's Achievement Performances to Their Needs and Attitudes	40
6	Summary of Subjects for Whom Longitudinal Achievement Data Were Available	41
7	Differences in Attitudes and Characteristics of Mothers of Children Showing Ascending Versus Steady Pattern of General Achievement Performance	42
8	Differences in Attitudes and Characteristics of Mothers of Children Showing Descending Versus Steady Pattern of General Achievement Performance	43
9	Differences in Needs and Characteristics of Children Showing an Ascending Versus Steady Pattern of Achievement Performance	44
10	Differences in Needs and Other Characteristics of Children Showing Descending Versus Steady Pattern of Achievement Performance	45

LIST OF APPENDICES

Appendix		Page
A	Summary of Sex Differences in All Variables .	46
B	Mother Interview Form	47
C	The IAR Questionnaire	51
D	Story Completion Stimuli	55
E	Summaries of Graduate Student Research Related to the Main Project	56

Also attached are two papers given in March, 1965, on this research:

Internal Control of Reinforcements and the School Learning Process

Independence Training and Children's Achievement

MOTHER-CHILD RELATIONS AND CHILDREN'S ACHIEVEMENT

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Among the plethora of studies concerning socialization of children, there are a growing number having to do with the effects of various conditions of socialization upon intellectual strivings and performance. No longer satisfied with a view of socialization placing emphasis almost exclusively upon the domestication of the child's early impulse life, psychologists have increasingly turned attention to describing differences among children in development of social motivations. Achievement motivation has been of particular interest to a number of investigators, who have, on the one hand, tried to relate motivational variables to variables of child rearing and, on the other, the child's achievement performance.

One source of impetus for such efforts has come from work of McClelland and his associates (McClelland, Atkinson, Clark, and Lowell, 1953) in measurement of the need for achievement. McClelland also offers a hypothesis regarding the role of early childhood experiences in situations involving "competition with standards of excellence." Specifically, he says, "Our hypothesis is that individuals with high achievement motivation will have been forced to master problems on their own more often and earlier than individuals with low achievement motivation" (McClelland, et al., p. 276, 1953). Winterbottom (1958) tested this hypothesis and found that earlier demands for independence and competence by mothers were indeed related to higher n Achievement in 8-year-old boys, as assessed in their responses to incomplete stories. She did not, however, find differences between her groups in actual school achievement, as assessed by teachers' ratings. Using Indian folktales and anthropological assessments of child rearing practices, McClelland and Friedman (in Swanson, Newcomb, and Hartley, 1952) found a positive correlation between emphasis upon achievement training in various Indian cultures and the frequency with which n Achievement was manifest in their folk tales.

Rosen and D'Andrade (1959) noted behavior differences between parents of high and low n Achievement boys, when they were observed interacting with their sons in a situation where the boys were asked to solve a set of problems presented by the experimenter. These investigators concluded that fathers and mothers played relatively different

roles toward their sons. Fathers were more likely to give independence training by encouraging self reliance and autonomy on the part of the boy; mothers of boys with high achievement motivation, in contrast, seemed to stress achievement training. Mothers of high n Achievement boys tended to be more dominant, set higher aspirations for their sons, and they were more responsive (both positively and negatively) to their sons' performances than mothers of boys lower in n Achievement. These authors suggest that achievement training probably contributes more to development of strong need for achievement than does independence training per se. Rosen in a later study (1964), utilizing an index of similarity of values between mothers and sons, found that earlier training was related to greater value similarity between them. However, degree of similarity was independent of whether mother placed a high or a low value on achievement striving. Rosen hypothesizes that early training creates anxiety which increases the child's dependence on the mother for emotional support. His increased dependence enhances the child's internalization of maternal values--of whatever kind.

Other investigators, interested within other frames of reference in how parental attitudes and child rearing patterns are related to development of behavior, have examined the relationship of assorted parental variables to differences in children's achievement performances. Early studies of the relations of parental variables to school achievement (Crandall, 1963) tend to suggest that competent school achievement is associated with more "positive" parent attitudes. However, these studies were often faulty in method and based largely upon situations where there were extremes of either parent or child behavior; therefore their results may not be generalizable to more typical situations. More recent studies by no means confirm those of earlier studies. For instance, Drews & Teahan (1957) found that mothers of gifted children who were strongly achieving in school had attitudes both more dominating and more ignoring than mothers of gifted children not so strongly achieving. They also found that among mothers of average children, mothers of strong achievers had more ignoring attitudes. d'Heurle, Mellinger, & Haggard (1959) in a study of personality, intellectual, and achievement patterns of gifted third grade children found relationships between both parental protectiveness and pressure toward achievement and the children's school performances. Their findings regarding the relation of children's personalities to their school achievement also imply parents who impose strong socialization pressures.

Crandall, Dewey, Katkovsky, and Preston (1964) in a study of elementary school children found that mothers of high-achieving girls tended to set high standards for their

performances and to be both less affectionate and less nurturant than mothers of less academically competent girls. They found no relationships between parental attitudes or behavior and boys' academic achievements. The present investigator (1961) obtained responses of mothers of first grade children to an Independence Training Questionnaire, enlarged from that of Winterbottom. It was found that later, rather than earlier, independence demands reported by mothers were related to better first grade achievement, when the effect of IQ on achievement was held constant; no measure of n Achievement was available for that population. Hoffman, Rosen, Lippitt (1960) reported that elementary school boys who perceived their parents as coercive performed more competently in the classroom than boys who perceived their parents as more lenient; however, these competent boys also tended to see their parents as more inclined to grant them autonomy of action in addition to their perceived coerciveness.

Still other studies have investigated the relation of children's achievement behaviors to parental variables as assessed by interviews and systematic observations. Crandall, Preston, and Rabson (1960) found that neither observed maternal nuturance nor affection were predictive of children's achievement efforts in nursery school free play; however, mothers' direct reactions to their children's achievement efforts did predict the children's efforts outside the home.

Crandall, Katkovsky, and Preston (1960) in another study observed children's achievement pursuits in a day-camp setting and assessed parents' reactions to their children from intensive interviews. Relationships between parental reaction and children's behavior were found to vary with sex of child, sex of parent, and also with the kind of achievement activity under consideration. They concluded that girls who spent much time in achievement efforts in a free play situation had fathers who encouraged them in and spent time with them in intellectual activities; their mothers also characteristically "pushed them toward intellectual pursuits." Similar results were not obtained for boys.

Crandall, Katkovsky, and Preston (1962) sought to relate intellectual achievement efforts observed in free play to the following child measures: (a) n Achievement reflected in TAT stories; (b) manifest anxiety; (c) intellectual attainment value; (d) expectations of success in achievement situations; (e) minimal achievement standards; and (f) degree of belief that the child, himself, controls by his own efforts the reinforcing outcomes of intellectual achievement efforts. Neither n Achievement nor manifest anxiety predicted observed achievement behaviors, nor were either of these variables related to children's IQ scores

and their scores on standard tests of academic achievement. However, expectations of success, value placed on intellectual achievement, height of minimal standards describing "success," and especially the child's attitude toward the locus of control of reinforcing outcomes all showed some stable tendencies to relate to either observed or tested achievement behavior among boys. Girls' results yielded little consistent or reliable data, except that intellectual attainment value was associated positively with achievement behavior observed in the free play situation.

Kagan & Moss (1962) from their extensive analysis of the longitudinal data of 89 Fels' families concluded that achievement striving is fostered among boys whose mothers show a high degree of protectiveness in their first years, followed by later encouragement and acceleration of the child's development during the nursery school and early elementary school years, but this attitude was simultaneously associated with a degree of maternal hostility toward the daughter shown during her first three years. These findings, in conjunction with their data regarding the relations among their ratings of maternal behavior, suggest that maternal acceleration of boys' and girls' development may have quite different bases. Their data also indicate that TAT measures of achievement themes taken in mid-adolescence and at age 25 are not predictive of achievement striving behavior up to the age of 10. After age 10, some significant associations occur.

It is only possible to conclude from the existing evidence that factors of socialization, however selected, defined, and measured, do not relate to the development of achievement behaviors and attitudes on the part of children in any simple fashion. Rather these data do suggest that in order to examine productively any single variable of socialization in relationship to the child's behavioral development, it is necessary to pay at least a modicum of attention to the context of other socialization factors in which it occurs. Similar attitudes and practices may have quite diverse effects depending upon what else is present in the psychological situation at the same time. One aim of the present study was to attempt exploration in a modest way of the productiveness of a multiple variable approach.

A survey of the existing literature regarding socialization of achievement strivings also suggests that much confusion arises in both how studies are designed and in how their eventual findings are to be interpreted because of lack of an adequate theoretical model to describe development and acquisition of achievement behavior. (The studies of Crandall and his associates are the notable exceptions to this lack.) Typically, many studies attempt to relate

highly global descriptions of parental attitudes or home atmospheres to child behavior. Variables are defined and assessed more often in terms of humanistic cultural values than in terms of their scientific or heuristic value. An unamended model of this sort is also typically vague about the means by which these climates of parental attitudes have their effect on child behavior. Having obtained a relationship between a global parental attitude and a facet of child behavior we are often hard put to know how to interpret it, whether to generalize it, and worst of all, how to take the next investigative steps to ascertain its bases.

Another style of socialization study emphasizes particular systems of behavior on the part of the child and parental responses to those. While potentially a more fruitful approach, most such studies to date have been done within theoretical contexts--either Freudian or learning theory derived--which regard behavior as ultimately calculated to relieve some tension within the organism. It is somewhat cumbersome to apply such models to achievement behaviors which seem better characterized as oriented toward goal striving and goal attainment. Several "extra" inferential steps are necessary and the behavioral predictions possible are frequently not clear-cut. While the present investigator cannot aspire, at this point, to develop fully a better model, a second aim of this investigation was to ask to what degree data such as these might be accounted for by a learning model employing <u>expectancy</u> of outcomes and <u>value</u> of outcomes in order to predict behavior (Rotter, 1954). Since both expectancy and value should be predictably related to parent-child interactions, exploration of these data from that point of view might provide a basis for developing testable hypotheses about the development of achievement strivings and behavior.

The present study attempted to explore in a sample of elementary school children the interrelationships of three major sets of variables: (a) children's achievement performance, assessed by specific academic achievement tests and by a measure of general intelligence; (b) children's attitudes toward and concern with achievement, assessed by means of an incomplete stories technique and the Crandall Intellectual Achievement Responsibility questionnaire (Crandall, Katkovsky, & Preston, 1962; Crandall, Katkovsky, & Crandall, 1965); and (c) maternal attitudes toward independence training and other more general attitudes toward child rearing, assessed by questionnaires administered during individual interviews with mothers. Data were also obtained from the children regarding their perceptions of their parents' relationships with them; however, these will be discussed in a later paper.

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Utilizing mother attitude variables as predictors, this paper will in turn examine their relationships to (a) effectiveness of children's achievement performances, and (b) children's achievement attitudes and concerns. The paper will also examine whether mother attitudes are related to disparities between children's needs to achieve and the effectiveness of their performance.

The presentation to follow will be presented in two parts. The first part concerns the investigation of the proposed interrelationships in a cross-sectional sample of third grade children. The second part examines the relationships of maternal attitudes and child attitudes to school achievement when changes in achievement performance are sampled over a five-year period.

PART I

Method

Subjects and Setting

Ss were 59 boys and 55 girls attending the Laboratory School of the University of Missouri at Columbia and their mothers. All families included in the study would be characterized as belonging to classes one, two, or three of Lloyd Warner's classification scheme (Warner, Meeker, and Eels, 1949). About 60% of fathers were employed in some professional or administrative capacity by the university. The remainder were primarily owners and managers of local businesses, independent professionals, and prosperous farmers.

All children were from intact homes and had no marked physical or personality problems. Most of them would be characterized as being several years more advanced in their standard achievement test scores than would have been predicted from their grade placement. The children of the sample were very bright; the average IQ for boys was 125; and for girls, 126. No child included in the sample had an IQ of less than 100. Mothers varied in estimated age from 26 to 45 years; their median education was the bachelor's degree. The median education of fathers was some graduate work completed.

The school provides classes from kindergarten through senior high school. Each grade has one classroom and a class consists of 25 to 30 children. There was, for the duration of this study (1961-66), relatively low turn-over in both children and teaching personnel, providing a very stable setting in which to do a study.

Collection and Preparation of Data

Scores on the California Achievement Test (Forms X or W) were compiled for all children who had been enrolled in the Laboratory School at the end of third grade and for whom mother interview data were available. Among these 114 children approximately 85% had been in continuous attendance in the school since first grade. Results of a Stanford-Binet (Form L-M) administered within 18 months of the collection of the school achievement data at the end of third grade were available for each child.

Since achievement scores at the completion of third grade were actually taken from several different intact classes, raw scores were converted into standard scores within each particular third grade class to make comparisons possible. Each child's standard achievement scores in Reading, Arithmetic, and Spelling were then averaged to find his mean achievement score. Using his mean achievement score as a base, his Reading, Arithmetic, and Spelling scores were also expressed as ipsative scores--i.e., as a value expressing his degree of variation around his own mean.

Measures of need achievement and need affiliation were obtained from an incomplete stories technique, which was individually administered to each S. The child was given 7 short instructions to: "Tell me a story about ...." The instructions to boys were the following: "Tell me a story about a boy who is just leaving his house; ... about a boy in school; ... about a mother and her son--they look worried; ... about a father and son talking about something important; ... about two men standing by a machine--one is older; ... about brothers and sisters playing--one is a little ahead; ... about a child putting together a puzzle--his mother is watching." For girl Ss, the story stems were modified to say "girl" or "daughter" when appropriate. The "house" stem was always given first as the introduction to the task and was not scored. The presentation order of the remaining six stems was varied randomly from child to child. Scores are based upon responses to these six. The examiner was permitted to ask S these questions if S's initial response did not cover the following points: "What happened in the story? What happened before? What is he/she thinking about? How does he/she feel? How will the story come out?" (See Appendix D.)

Initial attempts to apply the detailed n Achievement scoring system (McClelland, et al., 1953) to the children's stories were fruitless. Instead, stories were scored simply as belonging in one of two categories: clearly containing achievement imagery or containing unclear or unrelated imagery. For a story to be scored as containing achievement

imagery it had to involve at least one of the following: competition with a standard of excellence, unique accomplishment, or long term involvement. The story did not need to picture successful goal attainment.

When scoring for need affiliation was undertaken on the same stories at a later time, a parallel system was employed. A story was judged to contain affiliation imagery if one or more characters were concerned with establishing, maintaining or restoring a positive affective relationship with another person. Inclusion of either direct expression of or very strongly implied feelings on the part of the characters was necessary before affiliation could be scored. All stories were scored by two judges working independently and agreement was high--95% for need achievement and 87% for need affiliation.

Inspection of these raw data indicated that the stems had varied greatly in their likelihood of eliciting stories of either kind. In an effort to increase the sensitivity of the measure, the frequency with which stories involving achievement and stories involving affiliation were given to each stem was tabulated, and weights ranging from 1 to 4 were assigned to the various stems. In this way, a child giving scoreable stories to low "pull" stems could obtain a higher score than a child giving the same frequency of stories but to high "pull" stems.

Both distributions of need measures yielded positively skewed distributions which were normalized by means of a common log transformation. These normalized scores, however, still showed systematic differences related to the age of $\underline{S}$ at the time of testing. While most children had been tested during the year they attended third or fourth grade, some of the group had been tested as late as in the fifth or sixth grades. The normalized scores were therefore converted into standard scores within the age group to which the child belonged at the time he was tested.

Data were obtained from mothers in individual interviews of a highly structured sort. Each mother first received a letter soliciting her cooperation; a few days later an interviewer phoned and arranged an appointment at her convenience. Since parents agree when they enroll their children in this school to cooperate with research endeavors, response to our request was good. Among the total group of mothers thus contacted during a four-year period, slightly fewer than 1 in 15 rejected the interview.

The interview included questions of fact about the family, such as ages and sexes of all children, parental occupations and educational background, etc. It also included

a number of open-ended questions about child rearing practices. The data to be reported in this paper were derived from a scale of Maternal Attitude toward Independence Training (MAIT) and the Parent Attitude Research Instrument (PARI), both of which were administered as a part of the interview. (See Appendix B.) The independence training attitude measure was based upon the items originally devised by Winterbottom (1958) with 20 additional items added by the present investigator. For each item, the mother was asked to state the approximate age by which she would expect her child (or children) to be able to be depended upon to do the thing in question. Sample items are: To try to do hard things without asking for help; to select his own clothes to wear to school; to hold brief conversations with grown-up friends who visit the family; to show pride in his ability to do things well.

An item analysis of responses to the individual items revealed that 31 of the 40 items used produced responses consistent with total score, indicated by a value of chi-square at or below the .10 level of significance. Responses to these 31 items were used to obtain mother's score. Although mothers were encouraged to answer all 40 items, they had been permitted here and there to omit items they felt too ambiguous or unanswerable. For this reason mothers' scores were expressed as a mean age for the critical items answered. No mother's data was included if she answered fewer than 28 of the 31 scored items. In addition to the mean age of independence demand (MAIT $\bar{X}$), a standard deviation (MAIT σ) was also calculated for each mother's set of responses, i.e., a measure of each mother's tendency to vary around her own mean age expectation.

The PARI (Schaefer & Bell, 1958) was also administered within the context of the interview. Protocols were scored for each of the 23 subscales and then these scores were combined, following the findings of Zuckerman, et al. (1958), into three factor scores representing Maternal Control, Hostility-Rejection, and Democratic Attitudes.

When the raw scores obtained from the mothers' attitude data were inspected, as with the child data, systematic differences related to amount of maternal experience were noted. Using the age of eldest child as an index, it appeared that mothers with older children hadn't responded on the average in the same way as had mothers with younger children only. In order to reduce the variation added to the data from this source, mother interviews were grouped according to the ages of their children in the study at the time the interview was collected. For each group of mothers thus formed, raw attitude scores were converted into standard scores. For example, if a mother was interviewed in a year when her child in the study was in the fifth grade, her scores were expressed relative to the mean and variability of other mothers of fifth grade children.

Results and Discussion

Relations Among Maternal Variables

Table 1 presents the interrelationships among the various measures of maternal variables employed in this study. In the boys' data, although not in the girls', there is a tendency for the three attitudes assessed by mothers' responses to the PARI to be interdependent and for both greater maternal concern with controlling the child's behavior (PARI I) and less democratic attitudes (PARI III) to be associated with attitudes favoring later independence training (MAIT $\bar{X}$).

Among mothers of children of both sexes, expression of more controlling attitudes is associated with fewer years of education. Less well educated boys' mothers also gave a smaller range of ages in response to the MAIT items (MAIT Ω), and showed a tendency (not statistically significant) to have later expectations for independence and mastery behavior (MAIT $\bar{X}$) on the part of their children. Among all mothers, greater variation in ages at which various sorts of independent activities are expected is associated with lesser endorsement of democratic attitudes.

Relations Among Children's Achievement Measures

The relationships among children's achievement performance measures are, as one would anticipate, positive and statistically significant for both boys and girls. IQ and boys' standard achievement test scores correlate +.50, +.49, and +.53 for Reading, Arithmetic, and Spelling, respectively. The parallel correlations for girls are +.52, +.54, and +.55. Correlations among various achievement measures range between +.82 and +.67 over both groups of children. Ipsative achievement measures are unrelated to IQ and tend, because of their method of derivation, to be negatively related to each other.

Relations Among Children's Needs and Attitudes

Table 2 summarizes the interrelationships of two measures of children's needs (achievement and affiliation) assessed by the incomplete stories method, attitude toward personal responsibility for reinforcing outcomes of achievement situations (IAR), and manifest anxiety (CMAS) assessed by means of individually administered questionnaires. The relationships of all of these variables to IQ are also reported in Table 2.

Table 2 reveals that while need achievement and need affiliation were assessed from the same set of stories, they yield scores independent of each other within both groups of children. Strength of both needs is positively related to IQ in boys, but is unrelated to IQ in girls.

Manifest anxiety does not appear to be associated strongly with any other variable in Table 2 except the IAR measure. The finding that relatively greater attribution of control of behavioral outcomes to external sources (lower scores) is associated with more self-reported anxiety is consistent with the findings of other studies of both children and adults (Rotter, 1966).

Further relationships shown in Table 2, between the IAR measure and other child variables, suggest that greater belief in personal control of reinforcing outcomes is associated with better generalized achievement performance as reflected on a standard intelligence test. Surprisingly, on a theoretical basis (Rotter, 1966) and in comparison to results of an earlier study with college Ss (Odell, 1959), stronger belief in personal control of academic reinforcement outcomes is associated with fewer, rather than more, achievement stories told. (This finding will be discussed later in the light of findings regarding the relation of children's needs and attitudes to effectiveness of their performances.)

Maternal Variables and Effectiveness of Children's Achievement Performance

Table 3 presents findings relevant to the question: What is the relation of maternal variables to effectiveness of child achievement? Findings relevant to between child differences will be presented first, followed by findings regarding within child differences in achievement patterns.

An overview of Table 3 indicates that boys' mothers who favor earlier child independence, who show more variability in their range of independence expectations, and who are more permissive and positive in their child-rearing attitudes have sons who display greater effectiveness both in generalized achievement performance (IQ) and in specific school performance (standardized achievement test scores). Mothers of effectively achieving boys are themselves better educated. The set of corresponding correlations for girls in Table 3 (shown in parentheses in the table) indicates that only maternal permissiveness and years of maternal education are associated with the girls' greater effectiveness of achievement performance.

The findings above raise other questions. First, to what extent are the relationships between maternal controllingness-permissiveness (PARI I) and child achievement possibly attributable to differences in maternal education which are related to both? Partial correlations were, therefore, computed for the relationships between maternal controllingness-permissiveness and each of the child achievement measures holding effects of maternal education constant. The obtained values of partial r indicate that greater maternal permissiveness is still associated with more effective reading, arithmetic, and spelling performance in children of both sexes when maternal education is held constant. However, holding maternal education constant, reduces the relationship between mother attitude and child's IQ score to zero.

As noted earlier in Table 1, greater maternal controllingness and greater favorability toward later independence training tend to occur together among boys' mothers (+.45), although not among girls' mothers (+.14). In Table 3, later MAIT $\bar{X}$ among boys' mothers is also associated with lower generalized achievement and less effective specific achievement in arithmetic and spelling. Is less effective achievement among boys with mothers who favor later independence training the result of greater associated degree of controllingness? When partial rs are computed between MAIT $\bar{X}$ and boys' achievement scores, holding maternal controllingness constant, the values of r obtained are no longer significantly different from zero. (If the contrasting operation is performed, holding MAIT $\bar{X}$ constant, the values of r between maternal controllingness and the school achievement measures are barely affected, although the correlation with IQ is again no longer significantly different from zero.) These results suggest that indeed the negative association of later MAIT $\bar{X}$ and effective school performance in boys is mediated by the greater degree of maternal controllingness associated with the inclination toward later training. When MAIT $\bar{X}$ is unrelated to maternal controllingness (as was the case in the girls' data), MAIT $\bar{X}$ is also not related to effectiveness of school achievement.

Since the assortment of child activities represented in the Independence Training Questionnaire represents a wide range of developmental tasks, it was hypothesized that use of a broader range of ages might indicate more maternal attentiveness to the child's real competence in relation to specific tasks, and possibly more appropriate applications on mother's part of sanctions and rewards to the child's behavior. Inspection of Table 3 reveals that wider breadth of age estimates is associated positively with effectiveness of boys' school achievement. However, when the effects of maternal education on MAIT $\bar{C}$ (+.29) are held constant and these correlations between boys' achievement effectiveness and MAIT $\bar{C}$ are re-examined, their values are reduced to marginal levels.

All the above results, taken together suggest that greater effectiveness of children's achievement performance is associated with more permissiveness toward, and less concern about, or felt necessity for controlling child behavior. While these permissive attitudes are also associated with higher levels of maternal education, they are by no means solely accounted for by it. Among boys, the obtained relationships further suggest that the relationship between mothers' favorability toward earlier independence training and more effective achievement of their sons can be primarily accounted for by the greater permissiveness associated with earlier training attitude.

Maternal Vaiables and Within-Child Patterns of Achievement

Relationships between children's ipsative achievement scores and measures of maternal attitudes are also presented in Table 3. As noted earlier, the ipsative scores express the degree of the child's variation in specific areas of school achievement--Reading, Arithmetic, and Spelling--from his own average achievement. Scores are the algebraic difference between specific performance and over-all average performance. (These scores, as summarized in Appendix A, have a constant of 15 added to all scores to get rid of negative numbers.)

The obtained correlations suggest that a pattern of achievement in boys featuring relatively dominant reading skills is associated both with greater maternal favorability toward later independence training and with greater emphasis on controlling the child's behavior. However, when partial rs are computed between Rip and each of the attitudes, holding the effect of the other one constant, it appears that dominant reading skills are associated positively with later maternal independence attitude rather than attitudes about control.[1]

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[1] As the reader will have noted in the presentation of findings relating maternal attitudes to between child differences in achievement effectiveness, this investigator's previous finding (Chance, 1961) of a relation between lateness of MAIT and better achievement is not replicated in this study. However, since the 1961 study investigated first grade achievement, which mainly consists of reading proficiency, the above finding may cast some light on the source of the disparity.

In contrast, relatively dominant arithmetic skills among boys are associated with earlier MAIT $\bar{X}$ attitude and more democratic attitudes expressed by mothers. Relatively strong proficiency in arithmetic does not appear to be associated with maternal attitude about controlling the boy's behavior. However, since higher Aip scores are associated with maternal favorability toward earlier independence, while greater emphasis upon controlling is associated (+.45) with later training attitudes, the partial r was again employed. The value of partial r between Aip and PARI I when MAIT $\bar{X}$ is held constant is +.20. While this value is not statistically significant, it is interesting in the light of a similar finding given below for girls and some parallel findings regarding the correlations of the need achievement measure to be discussed later in this paper.

There is also a trend suggesting that greater variation in MAIT estimates (MAIT σ) is positively associated with relatively dominant arithmetic skills in boys. Notice too, that were we to partial out in the boys' data the negative relationship (-.48) between MAIT σ and PARI III, the size of the positive relationship between either of these latter variables and Aip would be increased.

The girls' data provide a less clear patterning of relationships, although a positive association between relatively better arithmetic performance and greater maternal emphasis upon control is present, and is similar to the relationship suggested in the boys' data above. Dominant arithmetic skills among girls also tend to be associated with less, rather than more, democratic attitudes on the part of mothers. Also of note is the positive (albeit not significant) relationship between maternal attitudes favoring later independence training and a dominant reading pattern in girls, because again it is similar to the relationship obtained in the boys' data.

It could be very cautiously suggested that mothers favoring later independence training (irrespective of their attitudes about control) are likely to have children who exceed their own average achievement in reading skills, while mothers more inclined to be controlling than permissive in attitude are likely to have children exceeding their own average of achievement in arithmetic skills. The latter perhaps is more likely to be true for the boy if his mother is inclined simultaneously to emphasize both earlier independence training and the importance of controlling the child's behavior.

Maternal Variables and Children's Needs and Attitudes

Table 4 shows the relationship of mothers' attitudes to children's use of achievement and affiliative themes in story-telling, as well as their reported anxiety (CMAS) and attitudes about the relation of personal effort to achievement outcomes (IAR).

Recall that need achievement and need affiliation, as measured in this study, are uncorrelated (Table 2). Boys manifesting both higher need achievement and higher need affiliation have mothers who are relatively more favorable toward earlier independence training. Stronger need affiliation is also associated with greater maternal permissiveness accompanying earlier training. Whereas, McClelland's (1958) original hypothesis suggested a specific connection between earliness of training and need for achievement, which was confirmed to some extent by Winterbottom (1958) in a study where attention was focused on need achievement only, the relations shown in Table 4 tentatively suggest a broader hypothesis. Perhaps mothers inclined toward earlier training have boys who move more quickly toward socialized maturity than do the boys whose mothers favor later training. (Data of the present sort, naturally, cannot tell us whether the boys' accelerated maturity is more nearly a cause or an effect of the mother's attitude.)

Further examination of this portion of Table 4 reveals the following: (a) higher need achievement among boys is also associated with mothers manifesting greater acceptance of the mother-wife role (PARI II); and (b) higher need affiliation among boys is associated with greater expressed inclination of mothers to act so as to reduce role differences between themselves and their children (PARI III). These two relationships among boys' data, along with the association of the stronger development of both needs with earlier MAIT X, lends support to a proposal of Rosen's (1964) that earliness of independence training may facilitate the incorporation of whatever motivational values mother espouses.

The present data also suggest an additional step, expanding that hypothesis--that mothers may espouse, depending on the conventionality their values and expectations, child behaviors following role-prescribed lines--different values for their different children. Specifically, boys' mothers inclined to accept conventional social roles might, if they favor independence training early, produce boys inclined to achievement striving. In contrast, other early training mothers inclined to be somewhat less conventional in adherence to role-prescribed behavioral differences may produce socially sensitive, and/or somewhat less conventionally motivated boys.

The girls' data, again, are less clear but indicate two relationships of significant size which at face value are in contrast to those found in the boys' data. Girls manifesting higher need achievement have mothers favorable to later independence training, and girls high in need affiliation have mothers less inclined to express democratic attitudes. However, both these findings would be consistent with the hypothesis derived above from the boys' data. The mother expressing conventional ideas regarding mother-child role relationship (lower or less democratic scores on PARI III) is associated with a conventionally affiliative daughter. The mother emphasizing reduction of role limits has a less typical daughter. Later training among girls' mothers is also associated with greater development of achievement need. Since need achievement is not the culturally dominant need of female personality, this finding suggests that the later training mother may have a daughter inclined to develop a pattern of needs in directions different from her mother's espoused motivational values. (Data summarizing boy-girl differences in need scores are found in Appendix A.)

Among children of both sexes, greater reported anxiety (CMAS) is associated with mothers' inclination to favor later independence training. This finding is contrary to the implication drawn by Rosen (1964) that earlier training enhances the child's compliance with the mother values because earlier training increases anxiety which increases the child's need for support from the mother to reduce that anxiety. CMAS scores also show a slight, although insignificant tendency to be positively related to broader ranges of age estimates given by mothers in response to the MAIT $\bar{X}$ measure.

In Table 4, higher levels of self-reported anxiety are also associated among both boys and girls with greater maternal emphasis upon controlling the child's behavior. However, when partial rs are used to examine in the boys' data the relation of both maternal attitudes (MAIT $\bar{X}$ and PARI I) to the CMAS measure, holding the effect of the other related attitude constant, later independence training retains its association with higher anxiety while attitude toward control does not. The relationship between maternal concern with control and anxiety among boys is mediated by the association of later independence training attitudes with greater emphasis on control. The same does not hold true for girls where both later independence training and controllingness of mother are independently associated with girls' self reported anxiety.

It has been suggested earlier in this report that the influence of earlier independence training may not be specific to the development of need for achievement but rather may enhance the possibility that the child is likely to

comply with the role or model of personality which his mother lays out for him. In contrast, the mother inclined toward later training may decrease the probability that her child will develop according to her image of the person he should become. The question can be raised as to why maternal differences in expectations about children's independence and mastery behaviors should have such an effect. Rosen (1964) has suggested that earlier training may increase the child's anxiety and thereby increase his emotional dependence upon his mother. It is possible to make an alternative hypothesis on the basis of the findings reported here. With the findings above we could suppose that when mothers state earlier or later expectations for independence training, they are telling us by implication something about the standards which they set for levels of performance which they will--or will not--reward in the child. That is, when a mother indicates that she expects her child to be able to do a given thing at age 3, rather than at age 6, perhaps she implies that she is willing to view a somewhat less than perfect performance as rewardable. Or stated another way, she may be saying that she will be inclined to reward the child for his effort to do the thing in question, somewhat independently of how well he does it.

This view of maternal differences in independence training attitude would account for why mothers might be more or less successful in inducing compliance in their children with their projected pattern for the child's personality development. Mothers, liberal with rewards (early as opposed to late) may induce in children higher expectancy of reward and thereby an increased "appetite" for their approval; mothers, withholding rewards until higher standards of performance can be met, may discourage the child from seeking her approval for compliance to ther expectations by lowering his expectancy that he can succeed in obtaining her approval.

The relation of children's attitudes of responsibility for outcomes of their achievement efforts (IAR) to maternal variables are also shown in Table 4. The findings obtained here suggest that IAR shows much the same pattern of relationships to mother attitudes as did the measures of achievement effectiveness shown earlier in Table 3. (This finding is consistent with the relationships between internal attitudes and effective school achievement reported in Table 5.) Greater personal responsibility assumed for achievement efforts among boys is associated with mothers' inclination to favor earlier independence training, with more variability of maternal expectations for independence, and with more permissive and positive child-rearing attitudes.

Boys who take greater personal responsibility for outcomes of their achievement efforts also have mothers who are somewhat better educated than do boys taking less responsibility. However, when partial r values are computed between

the IAR measure and the mother attitude measures, holding maternal educational level constant, the mother attitudes noted above are still significantly correlated with the boys' attitude of responsibility toward the outcomes of his achievement striving.

As was noted earlier in the discussion of the maternal correlates of achievement effectiveness, the obtained relationships between MAIT $\bar{X}$ and boys' school achievement performance could be mediated primarily by the degree of permissiveness associated with attitudes favoring earlier training. Examining Table 4, a similar question can be raised--whether child differences in IAR attitude might also be more related to the greater degree of permissiveness associated with earlier training, than to the favorability toward earlier training per se? However, in this instance the partial r values obtained suggest that both maternal attitudes toward independence training and toward control are related to the boys' attitude toward his responsibility for his achievement efforts.

No maternal attitudinal correlates of girls' IAR attitudes were found in these data, although the negative relation between MAIT $\bar{X}$ and IAR and the positive relation of MAIT and IAR are similar to those in the boys' data.

Children's Achievement Performance and Their Needs and Attitudes

Table 5 presents the relationships between measures of the children's effectiveness of achievement and their needs for achievement and affiliation, CMAS and IAR. Recall that the IQ Reading, Arithmetic, and Spelling scores reflect between child differences. Among boys, differences in achievement performance levels appear to have generally positive relationships to the development of both needs for achievement and for affiliation. However, examination of the relation of the ipsative (or within child) achievement measures among boys suggest that the stronger "Need Achiever" is likely to do relatively less well in Reading than in Arithmetic; while the stronger "Need Affiliater" boy shows a slight tendency to do relatively poorer in Arithmetic than in Reading or in Spelling.

These findings are consistent with those reported earlier in this paper. That is, the findings here parallel the relationships found between maternal variables and both children's achievement performance and children's needs and attitudes.

Among girls, the data tend to suggest that stronger Need Achievement is found among girls who are performing somewhat less competently in school. Girls' Need Affiliation is

apparently unrelated to between girl differences in achievement; however, data from the ipsative measures indicate that the more strongly affiliative girl is likely to do relatively better in Reading and relatively more poorly in Spelling. Within girl differences are unrelated to differences in strength of Need Achievement.

In summary, the relationships shown in Table 5 between measures of children's achievement performance and the psychological need measures employed in this study are the following: (a) both need for achievement and need for affiliation are related positively to between child differences among boys; (b) within child differences among boys are related to differences in need achievement in a fashion suggesting that more achievement oriented boys are inclined to do their best work in more quantitative and more highly structured tasks--perhaps those in which knowledge of results is rather immediately available; (c) stronger need achievement in girls tends to be negatively related to between child differences in performance; (d) within child differences among girls are related to strength of need affiliation in a fashion suggesting that more affiliatively oriented girls are inclined to work best in more verbal and less highly structured tasks.

Examining Table 5 further, higher levels of self-reported anxiety (CMAS) show a small tendency to be related to less effective achievement among boys. Similarly, more anxious girls do more poorly in Arithmetic than do less anxious girls. While boys' anxiety scores seem unrelated to within child differences in achievement patterns, the girls' data suggest that more anxious girls are inclined to display a pattern stronger in Spelling and weaker in Arithmetic.

It is also shown in Table 5 that the stronger the child's belief that he himself controls reinforcement outcomes in the area of intellectual achievement (IAR), the better he is likely to perform both on a generalized achievement measure such as IQ and on the more specific school subject achievement measures. These results appear equally true for boys and girls and confirm previous similar findings of Crandall, Katkovsky, and Crandall (1965), except that the present findings are equally true for both sexes. Table 5 shows no significant relationships between IAR and the within child achievement pattern scores for either sex.

As noted earlier in Table 5, need achievement among boys has only a small positive relation with measures of effectiveness of school performance, and in the girls' data there are negative relationships between need for achievement and effectiveness. Returning to Table 2, note that among both boys and girls, higher need for achievement is associated with less expressed belief in personal control over the outcomes of achievement striving (lower IAR scores); the relevant

values of r for boys and girls, respectively, are -.28 and -.44. Employing a formulation of Rotter's (1954) that behavior--effort, in this case--is a function both of the value of the goal for the individual and his expectancy that the particular behavior in question will secure the goal for him, it is possible to re-examine these relationships. Rotter further has defined conflict as a situation where the individual wants a goal very much (high need value) but doesn't believe that what he can do in the situation is likely to secure the goal for him (low expectancy).

If, when a child says that he, himself, has little control over his successes and failures in achievement situations, this reflects a low generalized expectancy of obtaining reward from such situations, we can attempt to examine by means of partial correlation the relation of need or motive to performance when expectancy differences are held constant. If the correlations between need achievement and school achievement performance are recomputed holding IAR constant, the values of the small, positive, zero order correlations are increased for boys; holding IAR constant, reduced the faintly negative correlations between need achievement and performance to zero in the girls' data.

It is provocative to speculate about the source of the negative correlation between NACH and IAR. Is the obtained relationship some unique characteristic of this particular sample of children studied? Why should children in a group so able and so liberally endowed with an environment nurturing of achievement striving and behaviors evidence conflict as defined here about achievement situations? In Table 2, it is shown that higher levels of self-reported anxiety (CMAS) among both boys and girls are associated with lesser inclination to take personal responsibility for the outcomes of achievement striving. This finding appears consistent with the view that low IAR scores, especially occurring with high NACH scores, indicate conflict. Albeit, holding CMAS constant does not alter significantly the size of the negative relationship between NACH and IAR in either the girls' or boys' data.

Examination of the interrelationships of two maternal attitudes to NACH and IAR, however, does shed some light on a possible source of the negative relationship between NACH and IAR in the boys' data. Table 4 shows that greater claim among boys laid to personal responsibility for outcomes of achievement situations (IAR) is associated with maternal attitudes favoring earlier independence training ($r = -.47$) and higher IAR is also associated with attitudes expressing more permissiveness in child rearing ($r = -.48$). Higher need achievement scores among boys are similarly associated with maternal attitudes more favorable to earlier independence training ($r = -.43$); while boys' Need Achievement scores are

apparently unrelated to the dimension of permissiveness-controllingness of mothers' attitudes. However, in Table 2 note that maternal attitudes favoring early training are strongly associated with expression of more permissive attitudes. Now, see what the relationships of NACH and IAR to the two maternal attitudes becomes when the effect of the positive correlation between earliness and permissiveness of training is held constant. Values of partial correlations between IAR and either maternal attitude with the effect of the other attitude held constant are virtually the same as the original zero order values. (It was noted earlier that IAR is associated with both maternal favorability toward earliness of independence training and toward permissive child rearing.) However, when values of partial r are computed between NACH and each of the maternal attitude variables with the other attitude held constant, we find no change in the -.43 between NACH and MAIT $\bar{X}$, holding PARI I constant. In contrast, the value of partial r when NACH is correlated with PARI I and MAIT $\bar{X}$ is held constant becomes +.35 ($p < .01$). (The original value of the zero order r between NACH and PARI I was +.09.) In other words, when the positive association of attitudes favorable to early independence training and permissiveness is taken into account, higher NACH scores are associated with more controlling attitudes on the part of the mother--more concern with controlling the child's behavior and getting him to comply with her expectations. The child's belief that he, himself, is largely responsible for the outcomes of his achievement efforts is also related to mother's inclination toward earlier independence training, but occurring in conjunction with less concern about controlling his behavior.

The same mode of analysis does not apply to the girls' data, since among girls' mothers attitudes toward independence training and toward controlling the child's behavior are not related. However, in Table 4 girls' Need Achievement is positively associated with later independence training, while more external attitudes about the outcomes of achievement efforts (IAR) are also associated (at a statistically insignificant level) with maternal attitudes favoring later training.

In summary, in the boys' case it can be hypothesized that belief in personal control of reinforcing outcomes is associated with early independence training attitude in a relatively permissive mother. Need for achievement on the other hand is associated with early independence training attitude in a mother relatively more concerned with controlling child behavior.

Summary of the Cross Sectional Study

The subsequent summary of the various findings of this investigation must be treated as the basis for new hypotheses to be tested in new situations, rather than as firmly drawn conclusions. The reader should bear in mind the limitations of what was done and with whom in evaluating the durability and the generality of the findings. The data were obtained from a clearly unusual sample of children and mothers--highly intelligent and residing in a community with superior socio-cultural advantages. It might be reasonably supposed that where parents enroll children in a special school, like the one studied, when the public school system is already an excellent one, that these parents place some very special value on education. This special valuing of education may well set them apart from the general population of parents altogether.

An equally important factor limiting conclusions is that many of the interpretations made here were developed to fit these particular data. While they have been examined from the standpoint of their internal consistency, their consistency with theoretical expectations, and consistency with the findings of other studies, their value as predictive hypothesis remains to be demonstrated.

Principal Outcomes

1. Effectiveness of school achievement is not directly related to mothers' inclination to favor either earlier or later independence training. An apparent relationship of this sort in the boys' data disappears when the association between controllingness of mothers' attitudes and lateness independence training attitude is accounted for.

2. Effectiveness of school achievement is directly related to mothers' attitude about control of the child's behavior. Greater maternal concern with control is associated with less effective school performance in both sexes. These relationships are still evident when the variable of maternal differences in education are controlled.

3. Children's manifestation of need achievement and need affiliation are related complexly to mother's attitudes about independence training. The present results suggest that at least one of the implications of independence training attitude for need development may be as a clue to the mother's likely performance as an evaluator and reinforcer of child behavior. It is hypothesized that mothers who favor earlier independence training, as opposed to later, are less stringent in their requirements for the quality of the child's

response. In other words, "early" mothers are more likely than "later" mothers to reward more primitive attempts on the part of the child to accomplish the act in question and to reward effort somewhat independently of quality of the performance.

4. It is hypothesized that on the basis of mother's early reward, the child develops an "appetite" or an expectancy for further reinforcements from her, which induces him to become increasingly sensitive to and aspiring to the role she expects of him. The specific nature of the need structure developed by the child will be some function of what she expects <u>this child</u> to become. Mothers' expectations are somewhat predictable from cultural prescriptions of sex-role and the degree to which mother accepts or rejects culturally prescribed roles. The conventionally oriented mother will tend to reinforce differentially achievement striving in her boy and affiliative striving in her girl.

5. The "early" rewarding mother may also generate in her child a sense of instrumentality about his behavior--that his efforts do in fact determine the outcomes he receives. Among children of both sexes, stronger belief in personal control of academic achievement outcomes is associated with greater maternal favorability toward earlier training.

6. Children's attitudes about locus of control of reinforcement is predictive of effectiveness of their achievement; i.e., children who say that their own efforts produce their academic successes and their academic failures achieve better than those who to a high degree believe that occurrence of success or failure is contingent on other factors. Measures of need achievement, need affiliation, and manifest anxiety are less impressive as predictors than attitudes toward locus of control, although some relationships were found.

7. Occurrence in these data of a negative relationship between child measures of need for achievement and attitude regarding locus of control, such that higher need for achievement was associated with less attribution of personal efforts as controlling reinforcing outcomes provoked a further analysis of the maternal attitudinal antecedents of both. Since, in the girls' data, more internal locus of control is associated with maternal favorability toward earlier independence training, while stronger need for achievement was associated with favorability toward later training, the obtained negative correlation was not inconsistent. However, in the boys' data both stronger internality and stronger need for achievement were associated with mothers' favoring of earlier independence training. Examining the relation of these variables to maternal attitudes favoring either

permissiveness or control of the child's behavior, it appeared that while internality was associated with greater expressed control, the need for achievement manifest by boys seems unrelated to this dimension of mother attitude. However, it had been noted in an earlier analysis that earliness of independence training attitude and relative permissiveness were associated among the mothers of these boys. If this association is taken into account, it now appears that stronger need for achievement is actually associated with the more controlling end of the dimension of mother attitude. While early independence training and maternal permissiveness is associated with more internal locus of control (and fewer achievement stories told), early independence training associated with greater maternal control of the child's behavior is associated with more achievement stories told (and more external locus of control).

PART II

A second objective of the present investigation involved longitudinal examination of children's academic achievement performance. Since children do not invariably remain constant in their levels of achievement as they move through the elementary school years, it can also be fruitful to ask what variables of mother attitudes and variables of children's needs and attitudes are related to long term changes which occur in achievement levels within children?

While the design of the present investigation is fragile from the standpoint of longitudinal interpretation, some exploration is still possible. First, only the child achievement performance data were collected in a truly longitudinal fashion; thus, judgments made from repeated achievement performance measures will be compared to data regarding mother attitudes and child needs and attitudes obtained at one point in time. Mother data were collected whenever the child first became a subject of the study. In the first year, data were collected from mothers of all children enrolled in the entire six grades of the elementary school. Thereafter, mother data were collected each year for 4 years from mothers of all first grade children and from mothers of all children newly enrolled in the school in a later grade. The majority of mother data was taken, therefore, sometime nearer to the beginning of her child's elementary school career than to the end of it. Children's need and attitude data were collected in the first year of the study throughout grades 3, 4, 5, and 6. In succeeding years, each new third grade was tested and data were collected for children newly enrolled in the school in later grades. An early attempt to use the story completion technique and questionnaires with children younger than third

grade indicated fairly high rates of inability to comprehend or to cooperate with the tasks.

Of the 254 children enrolled in the school between 1961 and 1966, only 114 had data usable for the longitudinal analysis.[2] One reason for this attrition was lack of sufficient tenure in the school, i.e., younger children had not been in attendance long enough; in about equal numbers older children were lost because of geographic mobility of the sample. Inspection of our records suggested that this mobility was not unrelated to variables (like age of parents, for example) which might in turn be related to the variables of the study. The usable sample, therefore is not wholly representative of the population of the school as a whole. (As noted earlier, even from the beginning the total school population was a rather unusual one.)

Method

All existing records of the children in the school were examined in the light of the following criteria of acceptability of their data for the longitudinal analysis: (a) mother data and child measures should be complete and usable; and (b) the child should have entered the Laboratory School in the first grade and have been in continuous attendance at least through the fifth grade. A total of 60 boys and 54 girls met these criteria. Scores from the California Achievement Test (relevant form) administered at the end of each school year were taken from the cumulative records maintained by the school for each child. Using the method described earlier, the scores of each child in Reading, Arithmetic, Spelling, and his Average Achievement were transformed into standard scores on the basis of the mean and standard deviation of his intact class group for each successive year.

A smoothed longitudinal plot was then made for each child showing his trend in Reading, Arithmetic, Spelling, and Average Achievement from first to fifth grade. In order to minimize influence of minor fluctuations and transitory shifts upon the picture obtained, a method of moving averages similar to that employed by Sontag, Nelson, and Baker (1955) was used. Specifically, each curve was based on 3 points, consisting of a mean of achievement measures in grades 1, 2, and 3, in grades 2, 3, and 4, and in grades 3, 4, and 5. Each child had four curves plotted--one showing his Average Achievement, and one curve each for Reading, Arithmetic, and Spelling achievement.

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[2] The ns in Part I and Part II of the study are identical by coincidence. However, roughly 60% of the cases appear in both samples.

Inspection of these plots suggested that in the majority of cases the trends of the 3 specific school subject curves were quite similar to each other and, therefore, to the curve for Average Achievement for any given child. Except for 3 boys and 2 gilrs who had curves ascending in one area of achievement and descending in another, approximately 1/3 of the cases had all curves showing identical trends and the remaining 2/3 showed an ascending or descending trend in two areas with a steady trend in the third area. All analyses to be reported here will be based upon the children's Average Achievement curves.

The following rules were devised for classifying the characteristics of the curves of individual children: (a) a given curve was classified as either "ascending" or "descending" if its terminal point lay 5 or more standard score points above or below its origin; (b) a curve was classified as "steady" if both its terminal and midpoint lay within ± 4 points of its origin; (c) if the terminal point lay within ± 4 points of its origin, but the midpoint lay outside that range, the curve was classified as "irregular"; and (d) if a curve showed an "ascending" or "descending" trend but its midpoint lay 5 or more standard score points outside, and in the opposite direction from, the limits set by its origin and terminal point, such a curve was also classified as "irregular." Table 6 shows the numbers of each kind of curve obtained by boys and by girls.

Next, it was appropriate to determine to what extent the changes in the curves might be accounted for by statistical regression. Both on the basis of tests of differences between means of the point of origin measures (mean achievement in grades 1, 2, and 3) for the Ascending, Descending, and Steady groups, and on the basis of correlations obtained between a crude index of change (terminal point minus point of origin) and point of origin, it was apparent that the probability that a curve would rise, fall, or remain steady was affected by the relation of its point of origin to the mean of the whole distribution of point of origin scores.

It seemed desirable to determine what variables of mother attitude and child behavior were related to change in achievement levels independent of the effects of the level of point of origin. Therefore, the following procedure was applied to the available data. For as many cases as possible, where the child had been classified as showing an Ascending or Descending pattern, a child from the Steady curve group of the same sex and with a point of origin for his curve within 2 points was selected as a matched control. The resulting numbers of children whose

data could be analyzed in this fashion are also shown in Table 6. Since suitable matches were not available for all children, data of 9 boys and 7 girls, besides that of children with irregular curves, were discarded from the analysis.

The analyses to be reported here involve tests of mean differences for variables of mother attitudes toward children and for variables of children's psychological needs and attitudes expressed toward themselves. Two comparisons can be made for each variable tested: (a) how do boys/girls who show an ascending pattern of school achievement differ from peers who initially achieved at a similar level, but who subsequently showed little change in performance level; and (b) how do boys/girls who show a descending pattern of school achievement differ from peers who initially achieved at a similar level, but who subsequently showed little change in performance level? Because of the matching procedure employed, the differences obtained in these comparisons should be free of the influence of factors related to initial level of achievement performance.

Results and Discussion

What maternal attitudes and characteristics are associated with long-term patterns of stability, gain, or loss in children's achievement levels? Table 7 presents the means, standard deviations, and their related t values for various maternal measures where cases of children showing a generally ascending trend over the first five grades of school are compared to matched cases of children who began school at a similar level but remained there. Table 8 gives similar information for children whose initial level of achievement performance declined in comparison to their appropriate controls. (Since the matching procedure employed here was approximate rather than exact, the t test for independent samples was employed in all tests.)

As background for some of the interpretation to follow, it would also be well to keep in mind the first findings presented in Tables 9 and 10. Mean of average achievement in grades 1, 2, and 3 of boys displaying an ascending trend of achievement over five grades was 48.50, while the similar mean for boys displaying a descending pattern was 52.29. The mean of Average Achievement for girls in grades 1, 2, and 3 whose achievement performance improved later was 47.18, while the similar mean for girls whose performance declined later was 52.40. It seems reasonable to regard the children showing ascending patterns of achievement performance as those who make a slower than average adjustment to the demands of early school work, but who are able to

compensate by their later rate of growth and development. They will be compared with a group of children whose slower adjustment in the early grades is prognostic of a generally slower than average rate of later development. The second set of comparisons contrasts children who apparently make a ready adjustment to the first few grades but are unable later to maintain that early rate of development with a group of children whose early good adjustment to school is prognostic of their careers in later grades.

Maternal Variables and Changes in Children's Achievement Over Five Years

Overall findings in Table 7 suggest that children who at first adjust slowly to school, but who show significant improvement later, in contrast to children starting at the same achievement level but not showing later improvement, have mothers who are more inclined to express dissatisfaction with their maternal role (PARI II). They are also more inclined than their counterparts to encourage assertiveness on the child's part and to treat him in an equalitarian-role difference reducing fashion (PARI III). Table 8, which shows like comparisons between children failing to maintain the relatively high level of academic performance shown in the first three grades and a group of children who do maintain their propitious start, indicates a similar set of differences. In other words, likelihood of changes occurring in level of average school achievement over a five-year period is greater among children whose mothers are less satisfied with their own roles and are more inclined to de-emphasize adult-child role differences in dealing with their children. However, these mother attitude differences are not associated with the direction of change.

Further examination of Tables 7 and 8 reveals that the mothers compared do not differ significantly in Age of Eldest Child (which was used as an index of maternal experience) or in their own educational level. However, all of the observed mean differences in Age of Eldest Child suggest that less role-bound mothers--or more role-dissatisfied mothers--may tend to be less experienced and possibly younger than their counterparts.

Maternal attitude toward independence training (MAIT $\bar{X}$) is associated among mothers of boys (but not girls) with the pattern of change occurring in school performance. The data suggest that boys showing an ascending pattern of achievement have mothers inclined more toward earlier training than are the mothers of their steady contrasts (Table 7). Boys who maintain their relatively high level

of academic performance shown in the first three grades, in comparison with those showing a descending pattern also have mothers inclined to favor earlier, rather than later, independence training (Table 8). Maternal attitudes favoring earlier independent training, then, appear to be associated with the occurrence among boys of either a stable level of relatively good academic performance, or else a trend toward improving performance over the early years of school.

While the same comparisons in the girls' data do not yield statistically reliable differences, it is of interest that the observed differences are the opposite of those observed for the boys. It is also of interest that the variable of maternal controllingness (PARI I) which was negatively associated with between child differences in performance at the third grade level, shows no relationship to the within child patterns as analyzed here.

When the results shown in Tables 7 and 8 are compared, a hypothesis parallel to one noted in connection with the results obtained from the cross-sectional analysis of third grade data is suggested. The mother who accepts conventional values and roles for herself and for her children is associated with a child who is consistent in performance. In contrast, mothers who are critical of conventional role definitions tend to have children showing less consistency in their achievement performances.

When the results pertinent to the independence training variable in both tables are examined, they suggest the following. Maternal inclination toward relatively earlier independence training among boys' mothers is associated with boys who either start out propitiously in school and maintain their level of performance in the ensuing years or with boys who despite a somewhat more halting early adjustment to school, show tendencies to improve by the time they reach later grades. One could propose that among boys' mothers, maternal inclination toward earlier independence training is more consistently predictive of boys' later elementary school achievement than of their earlier achievement. Among mothers of girls, the direction of the association between MAIT $\bar{X}$ and girls' pattern of achievement performance seems to be reversed. Similar observations have been made by other investigators with regard to achievement motivation in the female (McClelland, et al., 1953). Explanation of such differences are by no means easy; however, a hypothesis derived from the results reported from the third grade analysis seems worth mentioning again. Is it possible that the effectiveness of early independence training is not specific to incorporation of the particular motivation or value for achievement, but rather enhances the incorporation of whatever mother values for the particular child in question.

Since mothers' reactions to particular children would almost certainly be influenced by the sex of the child and her expectations for his eventual sex role behaviors, early independence training might, on the average, produce a striving boy and a sociable girl. However, since need for achievement and need for affiliation are not poles on a continuum, the need structure induced by the less conventional or by a later independence training inclined mother is likely to take other variations.

Child Variables and Changes in Children's Achievement Over Five Years

What differences in children's expressed needs and self descriptions are associated with ascending and descending patterns of achievement? Means, standard deviations, and t values pertinent to this question are presented in Tables 9 and 10. These tables also summarize the point of origin data for the achievement curves on which the children were classified, as well as IQ data for the four groups of children.

As would be expected from the subject-matching procedure employed, none of the groups of children showing ascending or descending patterns of achievement differ signigicantly from their matched controls in their mean of average achievement during the first three grades of school. Mean IQ data shown in Tables 9 and 10 are based on measures which were obtained from Ss during either the third or fourth grade. The groups also do not differ in this respect.

Table 9 indicates that boys who adjust to school more slowly, but improve later, manifest less achievement imagery than their steadily achieving peers. The similar comparison in Table 10 also shows more achievement imagery among boys who maintain an initially high level of achievement performance than among boys whose initial performance level declines. Consistency of school performance from first through fifth grades appears to be related to more achievement imagery on the part of the boy; however, it is noteworthy that this effect is somewhat independent of the level of effectiveness at which the school achievement is taking place. Or to state it another way, boys who show change in school performance over time (in either direction) manifest less achievement imagery at age 9 than their steadily achieving peers.

The girls' results parallel those of the boys in the following way: Among girls, those showing change in achievement level manifest less affiliative imagery than those showing stability of achievement level. When these findings are viewed as a whole, they suggest a hypothesis that greater

stability of school achievement performance in the early grades may be associated with earlier differentiation of social emotional needs, evidenced by the child's more clear-cut development of social need structure congruent with the conventional expectations for his sex role. This hypothesis is supported by the previous findings regarding the maternal attitudes correlates of stability or change in pattern of school performance. There it was noted that stability was associated with greater maternal acceptance of her own role and less inclination on her part to reduce role differences between herself and her children, in contrast to attitudes of mothers whose children showed change performance.

Only one comparison, in Tables 9 and 10, for the variable of children's self-reported anxiety level (CMAS) proves to be statistically reliable. Boys whose early slower adjustment to school is prognostic of continued slower progress, in contrast to boys whose later school progress shows improvement over earlier levels, are more anxious. In fact, if all the means of CMAS scores for all children are inspected, this group of boys appears to be the most anxious children in the entire sample. Of course, data such as these, cannot indicate whether their anxious discomfort produces or is produced by their situation in school.

Tables 9 and 10 show trends suggesting that children of both sexes who either perform well in early grades or those who improve over their initially slow start in school exceed their matched peers in Intellectual Achievement Responsibility attitude (IAR). Recall that higher scores on IAR indicate more willingness on the part of the child to say that both his successes and his failures in academic achievement activities are a function of his own behavior rather than the behavior of other people. These findings fit well with those obtained in the cross-sectional analysis of third grade achievement performance data. In that analysis, IAR was associated positively with higher levels of inter-individual achievement performance.

Summary of Longitudinal Findings

The overall outcomes of the longitudinal and cross-sectional analysis of children's school achievement and their maternal and child correlates are somewhat similar. The most marked dissimilarity is in the finding regarding the relationship of maternal attitude toward controlling the child's behavior to child achievement performance. Maternal inclination to be relatively controlling is negatively associated with between child differences in child achievement in a large sample of third graders of both

sexes; however, the same maternal attitude is not associated with shifts in achievement performance over a five-year period (grades 1 through 5). In contrast, maternal attitudes toward her own role and her favorability toward treating children in an equalitarian manner is related to shift (without regard to direction) in the child's performance over the early years of elementary school. Despite trends, these same variables were not clearly related to effectiveness of performance in third grade, although they were related to between child differences in need-achievement and need affiliation. Maternal attitude toward independence training, also unrelated to third grade effectiveness, is related to either maintenance of a high degree of effectiveness over five years or a general improvement over that time in the longitudinal analysis.

The child variables showing relationships to child performance over the five years studied suggest that children whose level of performance shifts (either up or down) are those in whom social needs--achievement in boys and affiliation in girls--are less strongly manifest in third grade than those of peers maintaining their early level of achievement. These findings also suggest that the child's attitude about the degree to which he himself controls the reinforcements he obtains at school, not only is strongly predictive of between child differences at third grade, but also shows some tendency to predict whether children making a relatively slower start in school will, or will not, show subsequent improvement. Similarly, this variable to some extent predicts maintenance of propitious start in the primary grades for subsequent years.

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TABLES 1 - 10

Pages 36 - 45

APPENDICES A - E

Pages 46 - 56